



Drivers, trends and scenarios for the future of health in Europe. Impressions from the FRESHER project

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Abstract

Non-communicable diseases (NCDs) such as cardio-vascular problems, diabetes, cancer, multi-skeletal disorders, depression, neurologic disorders and many more are the major cause of health problems and death in OECD countries. These diseases develop earlier among underprivileged people. Chronic-degenerative diseases, however, are to a large degree avoidable. In our foresight project FRESHER (FORESIGHT AND MODELLING FOR EUROPEAN HEALTH POLICY AND REGULATION) we discuss policy options with stakeholders from health, research, care, patient organisations, insurances and policy-making that go beyond the usual activities and pose alternatives that promise to be more successful. From an analysis of trends that affect NCD development far beyond the usual determinants of tobacco and alcohol consumption, salt, sugar and fat intake or sedentary behaviour the most relevant and significant trends are combined to four scenarios depicting possible futures. The options for alternatives presented contribute to the discussion of policies for the future in a comprehensive approach to “health in all policies” in the EU. NCDs are not a matter of medicine and health only. Thus the traditional approach of health policy has to be extended. Out of the box thinking is needed to pay tribute to the complexity of future health systems that need to include aspects like equity, literacy, mobility or urban planning. A systematic and holistic approach is required to address all drivers and determinants leading to a healthy life and well-being.

Keywords Foresight · Non-communicable diseases · Public health · Health policy · Scenarios

The limits of traditional policy-making

Public health is one of the greatest challenges our society and policy makers will face in the near future. It will be accompanied by demographic change, increase of non-communicable diseases (NCDs), increased burden on the health system, and shortage of money - but also by social and technological innovations. These challenges will have much greater dimensions than today. For example, the Sustainable Development Goals (SDGs) take an ambitious and missionary approach to

essentially transform human society and to chart the path towards promising trends, overcoming the negative trends. The nexus between the SDGs and the trends and drivers on health point towards important fields of action of policy-making as well as to societal transformation.

We will only be able to cope with these challenges, if we are well prepared and broaden our perspective from health to societal developments in a more holistic sense. Public Health needs to be included in our changing cognitive frames towards more responsibility at multiple levels. To tackle the challenge of Public Health means to think beyond the rising costs of health care and the shortage of qualified personnel. It means to include health in almost all other areas of our life, especially in policy making for research and innovation as well as in our personal every day actions. Health cannot be treated as an isolated policy field alone. The siloed thinking that has been dominating the health discussion over several decades has to be overcome to formulate an integrative and holistic approach towards sustainable Public Health policy to target challenges

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as the spread of NCDs. Some important steps at national and transnational levels have already been taken in this direction.¹ The fast pace of societal developments today, including health and also research and innovation, demands quick reaction and adaptation processes by policy makers. Especially phenomena like NCDs which are not only a matter of medicine and health but of society demand for an extended health policy – or rather policies. However, we know from experience that institutional inertia can be quite persistent and change needs a lot of time to become effective. At the same time, there are rising expectations as to what research and innovation and health care reform can achieve and how this can be supported by policy measures. “The complexity of the interaction of a larger number and variety of strategically active stakeholders at different levels makes targeted policy interventions more difficult and thus reduces the leverages of policy-makers. In other words: as expectations rise, the structural capacity of public policy to have an impact runs into its limits” [1].

Against this background this article explores recent trends affecting health, especially NCDs, as a policy field [2]. We will also discuss how the trends and drivers shape transformative scenarios and their potential for future policy options, specifically, how to extend health policy and make it adaptable to current challenges posed by NCDs. For this purpose, we draw upon the results for the EU-funded foresight project FRESHER (Horizon 2020), where the focus was on FORESIGHT AND MODELLING FOR EUROPEAN HEALTH POLICY AND REGULATION. The transformative aspects of the scenarios may shed light on possible future developments, tensions and differences from current practices in policy making for public health, and especially targeting NCDs. We will then look into several fields of action for policy making that result from these tensions.

The burden of non-communicable diseases

Non-communicable diseases (NCDs) such as cardio-vascular problems, diabetes, cancers, chronic lung disease, depression, musculoskeletal and neurologic disorders and many more lead to the loss of 3.4 million potential productive life years in EU countries and account for more than 70% of health costs in the

¹ According to their capacities and possibilities countries have taken different pathways to address the burden of NCDs. A frequent starting point appears to be to focus on an individual risk factor and/or a single disease. It is not uncommon to find countries that have a cancer and/or heart disease prevention plan, alongside tobacco control and/or dietary measures. Over the last five years, there have been positive trends, with more countries developing specific policies and legislation relevant to NCD prevention and control, backed by dedicated budget lines. The main effort was directed at improving access and quality of the health care services for suffering people, but also at impacting on behavioral risks and, to quite a lesser extent, at social determinants, such as income, education, employment, and housing and environmental determinants, as their role was not always recognized.

OECD. In Europe, NCDs account for nearly 86% of deaths and 77% of the disease burden, putting increasing strain on health systems, economic development and the well-being of large parts of the population, in particular people aged 50 years and older [3, 4]. At the same time, NCDs are responsible for many of the growing health inequalities that have been observed in many countries, showing a strong socioeconomic gradient and important gender differences. They are the major cause of health problems and death in OECD countries; these diseases develop earlier in underprivileged people and lead to death more often and earlier. Chronic-degenerative diseases, however, are to a large degree avoidable. Globally, there has been a growing awareness of and mandate for action on NCDs in recent years [5, 6].²

Regarding diseases, although diverse, chronic NCDs all deserve proper attention. A group of four diseases (cardiovascular diseases, cancer, diabetes, and chronic respiratory diseases) and their shared risk factors account for the majority of preventable diseases and death in the WHO European region. These four NCDs also share common determinants that are influenced by policies in a range of sectors, from agriculture and the food industry to education, the environment and urban planning. They share common pathways for interventions through public policy.

Analysis beyond the usual risk factors

The rather random definition of what NCDs are and which disease belongs to this group of indications sometimes make the distinction between risk factors or determinants on the one hand and trends and drivers on the other hand unprecise. In fact, some diseases may themselves be determinants for other indications. For example obesity can be a determinant for diabetes type 2. Similarly, depression can be defined as a trend in our modern society today as statistics have been showing a steady increase over the years. Depression can also have effects on determinants such as alcohol abuse and smoking, some forms of depression may be a determinant for other

² NCDs are linked by common risk factors, underlying determinants and opportunities for intervention. The identification of major risk factors in the 1950s, e.g. linking tobacco smoking to lung cancer, led further on to the awareness of other major risk factors mainly in the 1960s and the early 1970s. In the first place strong actions were taken to adopt strategies for tobacco and in rapid succession for alcohol control [7], finally resulting in the concept of an integrated approach to the prevention and control of NCDs at a WHO meeting in 1981, based on growing evidence that major NCDs, such as heart disease, stroke, cancer, chronic respiratory disease and diabetes, shared common risk factors such as tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol. In 2008, the World Health Assembly endorsed the Action Plan for Implementation of the Global Strategy for the Prevention and Control of Non Communicable Diseases (2008–2013). WHO Europe further developed an action plan for implementation of the European Strategy 2012–2016 [8–11] (for mapping emerging epidemics, reducing exposure to risk factors and strengthening health care for people).

NCDs, e.g. cardio-vascular diseases. Thus the line between one and the other is often opaque and NCDs remain complex issues to deal with [12].

We define drivers as developments causing change, affecting or shaping the future, a driver is the cause of one or more effects.³ For example, taxation can be a driver for regulating alcohol consumption. A trend on the other side is a general tendency or direction of a development or change over time. It can be called a megatrend if it occurs at global or large scale. A trend may be considered as strong or weak, increasing, decreasing or stable, the definition by FAO⁴ is rather unspecific and strongly depends on subjective assessment of the beholder. There is no guarantee that a trend observed in the past will continue in the future. Megatrends are the great forces in societal development that will very likely affect the future in all areas over the next 10–15 years, for example urbanization or demographic change [12].

Following this logic, trends and drivers behind each risk or determinant for NCDs can be identified and taken into account in policy making and intervention. There are multiple examples of interventions to reduce the overall prevalence of risk factors in the population, in particular addressing some of the biological risk factors (such as obesity, hypertension, dyslipidemia, diabetes) and of behavioural factors (such as tobacco and alcohol consumption, impacts of dietary behaviour, patterns of physical activity, exposure to environmental harm, mental health). Social determinants represent nonmedical psychosocial factors that affect both the average and distribution of health within populations with increasing evidence of their impact on NCDs. They include the distal political, legal, institutional, and cultural factors, and the more proximate elements of socio-economic status, physical environment, living and working conditions, family and social network, lifestyle or behaviour, and demographics.

As a summary risk factors can be classified as [13]⁴:

- behavioural (dietary risks, alcohol use, tobacco smoking, physical inactivity and low physical activity)
- biological (hypertension, high body mass index, high total cholesterol, and high fasting plasma glucose)
- environmental (outdoor and indoor air pollution, outdoor temperature, walkability (parks and open spaces, road traffic), access to healthy and unhealthy products (concentration of bars, restaurants, convenience stores and grocery stores and the prices of risky products, such as alcohol, tobacco and high-sugar foods) and occupation)

- socio-economic. Risk factor patterns vary for different socio-economic groups and a consistent measure of socio-economic status is educational attainment.

In our foresight project FRESHER, the objective is the representation of alternative futures where the detection of emerging health scenarios will be used to test future research policies to effectively tackle the burden of NCDs. Rather than just extrapolating past health trends, the project consortium used a variety of foresight techniques that account for the interdependencies of structural long-term trends in demographic, gender relations, technological, economic, environmental, and societal factors for European countries. In doing so we relied methodologically on qualitative foresight tools combined at the end of the project with quantitative micro-simulation.

The most relevant and significant trends leading to an increased risk for NCDs were identified with experts in workshops as well as in an online survey and subsequently combined in a next step to four scenarios depicting possible futures. We developed scenarios using them to identify and then discuss policy options with stakeholders from health, research, care, patient organisations, insurances and policy-making that go beyond the usual activities and pose alternatives that promise to be more successful. The main questions directed at the experts were: What are the determinants that lead to certain trends with negative health effects and how could they be changed? The results of these consultations are included in the FRESHER report 3.1 “Horizon Scanning” available at the FRESHER web-site, all trends are described in detail in this report and are not listed in this paper due to limited space [12].

Overall, **socio-demographic** and **economic trends** were considered to be critical or very important drivers in the reduction of the incidence of NCDs. Socio-technological trends, such as medical innovation or patient empowerment were considered to be less important in preventing NCDs. Medical innovation could act as game changers of any scenario, if revolutionary cure is discovered, but also widen the health gap if the costs for high-tech medical improvements are too high. Citizen empowerment was seen as health literacy and thus also as an indicator for education and access to the internet. **Inequality** stands out as one of the most unpredictable but at the same time most important trend. In the scenarios and for later calculation in a model the Gini Index was used as an indicator for inequality [14]. **Economic development and technological change** was included as a trend to take possible future dynamics influencing employment and working conditions into account. **Demographic change** as a mega trend was considered in the scenarios as the number of expected healthy life years given the respective development of other indicators, such as being crucial for environmental, economic and socio-technological factors. **Climate change**

³ Definition adapted from ‘Global Foresight Glossary and Drivers of Change in Ecosystems and Their Services’: <http://www.fao.org/docs/eims/upload/315951/Glossary%20of%20Terms.pdf>

⁴ Global Health Observatory (GHO) data, risk factors: http://www.who.int/gho/ncd/risk_factors/en/

was not considered as most influential effect on NCDs by the experts taking part in the survey, however, it was considered as the most important trend affecting life and health overall. The obvious indicators for this trend were greenhouse gas emission and global surface temperature. Considering the urbanization trend, not the rate of urbanization was taken into account but rather the conditions and quality on an **individual's living space**. Given the expectation that the proportion of Europe's population living in cities may reach 86% by 2050, this could not only potentially reduce the incidence of NCDs by promoting access to **fresh water, clean air and healthy food**, but could also provide the infrastructure to support healthy ageing policies and more equal access to services. Urbanization was therefore included in the scenarios but with an emphasis to the quality of life, expressed with the factor of air quality. **Food trade and agriculture** policies were considered to be more subjects to sectoral changes within the current economic context. For influence on NCDs, indicators as **access and consumption of fresh fruit and vegetables** contributing to healthy diets were of great importance.

Preparing for uncertainties and alternative futures

On the basis of the survey's comments and the discussion within the consortium, the project team further reviewed the key trends to create the backbone of the FRESHER scenarios. The most important and uncertain drivers ("critical uncertainties") that influence the dynamics of health and well-being that could play a key role in the future of health policy were listed and included in the scenarios as key drivers. Special attention was turned to the overarching importance of the trends related to equity as well as to a low carbon economy. These trends were classified as keys due to their capacity to influence the other trends. They also contained dynamics that influence the future of employment and working conditions.

The intersectional approach in the discussions at the workshops led to a broad field of policy topics, while focussing on the two major issues urban environment and health and innovative partnerships for improved health and environment, proving once more that a holistic approach rather than a mere focus on preventive medicine is needed to address the health issues of the future. As a key value added to pre-existing research on the subject, FRESHER relies not just on the extrapolation of past health trends, but also on a variety of foresight techniques. Therefore, the project, and the partners who have been motivated to work together in the consortium, try to bridge the gap between two quite diverse scientific communities that usually act independently, at least in the health field: the foresight researchers which use formal qualitative

techniques to identify major trends and drivers in the evolution of societies in order to target critical uncertainties and prepare for alternative contrasted scenarios for the future on the one hand, and the public health research community on the other hand, in particular those disciplines (biostatistics, epidemiology, health econometrics) which use quantitative techniques to prospectively forecast and model the epidemiological pattern of diseases and health systems.

The scenarios developed were used to identify possible innovative policies in health and related fields and to quantify the evolution of risk factors for NCDs and determinants for each scenario in order to feed these factors into the microsimulation model that is developed in the FRESHER project [15].

The FRESHER scenarios

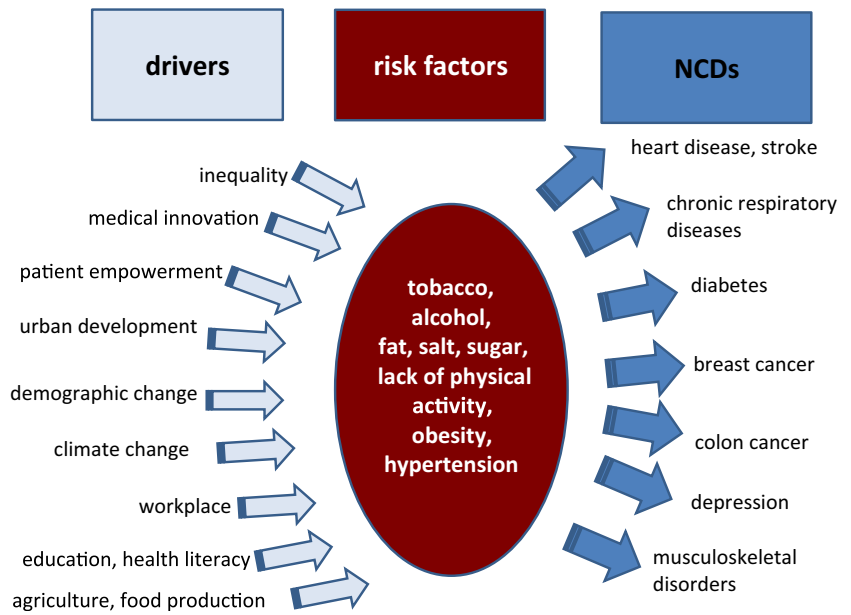
In order to draw distinct and consistent pictures in four scenario spaces the factors were defined in different values, the combination of the factors make up four distinct scenarios, the differences and similarities are best depicted in Figs. 1 and 2 [16]. None of the four scenarios can claim to draw a complete picture of the future, but they can still provide alternative models that may exist side by side in different segments and they all include transformative aspects, especially the more positive ones.

It was a requirement of the FRESHER process that these scenarios could serve as a basis for policy action, delineating policy alternatives and new policy combinations. Table 1 presents the summaries of the respective scenarios. "**Healthy Together**" depicts a very positive picture of the future with all sectors, government, the private sector and citizens, working together to give absolute priority to health and wellbeing for all. Thus all policy measures and private initiatives are leading to equity and good living conditions for all, a new socio-economic pattern provides for the means to take better care of one's own health and industry strongly considers environmental issues thus concentrating on recycling and circular economy.

Strong emphasis is also given to a positive turn toward health in the second scenario "**We Will Health You**", but with the purpose of maintaining a healthy workforce for the continuation of economic productivity and for ensuring the sustainability of the healthcare systems. Here, fair labour legislation is implemented to give workers time, money and knowledge to take better care of their health. Through implantation of a microchip 24/7 surveillance is achieved.

Strict laws are implemented regarding immigration and focussing on economic growth at the costs of the environment. Market forces are also dominant in the third scenario "**The Rich Get Healthier**" with freedom and meritocracy as pillars of societal structure. The healthcare sector is privatised and

Fig. 1 Example for Cause-Effect-Relationship of Drivers and Risk Factors for NCDs (some drivers help to contain risk factors while others have a leverage effect) [12]



labour deregulated to revitalise economy. Health is like other services potentially available but expensive. There is a growing tension among citizens as the welfare state was

demolished. Global protection of the environment, however, is ensured by pricing it – most of the economies are decarbonised and climate change is now under control.

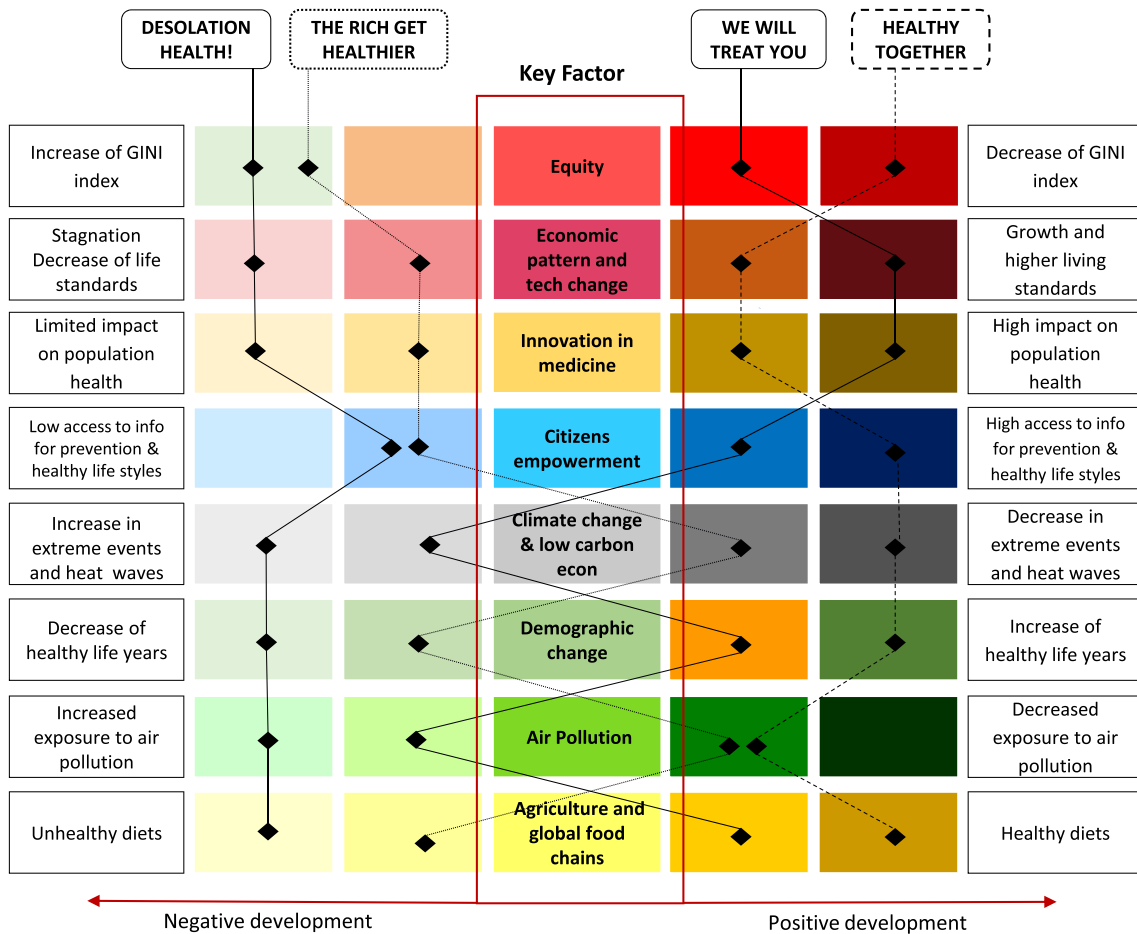


Fig. 2 Overview of FRESHER Scenarios and their key characteristics [16]

Table 1 Short descriptions of FRESHER Scenarios [17]**Healthy Together**

The priority is to promote health and well-being for all.

Governments, the private sector and citizens' networks collaborate closely to develop solutions promoting quality of life, healthy opportunities and efficient care. As governments take the lead, citizen participation is ensured throughout the policy making process, to promote equity, sustainability and human health in all policies. There is high value to leisure, sense of community and nature. Fair income levels up living conditions, ensuring better standards to all. A new socio-economic pattern provides for the means to take better care of one's own health but also to care for others through informal networks and community engagement. Recycling and sharing practices replace the productivity paradigm and the pressure on the environment.

We Will Health You

The priority is to maintain a healthy workforce, for the continuation of economic productivity & for ensuring the sustainability of the healthcare systems

Thanks to big data, public and private investments effectively influence citizens' behaviour towards healthy lifestyles. Employers provide healthy working environments and care services. Fair labour legislation is implemented to give workers money, time and knowledge to take better care of their health. The top down approach is ensured by ambient 24/7 surveillance and implanted chips for affordable early diagnostics, tele-medicine and tailor-made treatment. The new era of economic growth and social progress focused on delivering more to everyone, with environmental sustainability seriously monitored. Increasing amount of economic and environmental migrants are let into the EU following strict immigration policy and by primarily considering their skills and possible contributions to the EU's economic growth.

The Rich Get Healthier

Freedom and meritocracy are the pillars of societal structure.

Market forces are dominant and a 'light government' guarantees their functioning. European states have privatised the health-care sector to reduce the public debt and have deregulated labour to revitalise the economy. Health is now just like many other services: potentially available, but expensive. Human health and lifestyle are left to individuals' choices and capacities. The more you can afford, the better treatment you get, thanks to expensive medical innovations including new-generation biomedical devices. The global protection of the environment is ensured by pricing it. It is a socio-economic system where most of the economies are decarbonised and climate change is now under control. The demolition of the welfare state has created new challenges: the growing tensions among citizens cause security issues to rise in the political agenda and the number of marginalized citizens increases.

Desolation Health

The European model declined and the European governance, shared values and the common market were destroyed following the economic crisis.

To gain some legitimacy, national governments cooperate with different stakeholders for policies that are short-sighted and do not consider health implications. Economic stagnation has led many countries to gradually reduce the number of people that can avail public services, increase user charges for services and limit the number of public health providers. "Health shocks", defined as unpredictable illnesses that diminish health status, increase and innovative medicines, focusing on quick-fix solutions, and treatments are hardly affordable for European states and citizens. The deterioration of living standards undermines the community values and leads to tensions among citizens and mistrust in policy making. Citizens suffer from the consequences of climate change as international containment agreements have been stalled for decades.

The fourth scenario "Desolation Health!" gives a very negative picture of the future with regard to the European governance, shared values and the common market having been destroyed following the economic crisis. Implemented policies are short-sighted and do not consider health implications. The number of people who can access public services has been reduced; treatments are hardly affordable for citizens and European states. The deterioration of living standards undermined community values and led to tensions among citizens and mistrust in policy making. Citizens suffer from the consequences of climate change as international containment agreements have been stalled for decades.

These scenarios serve as inspiration for the design of a forward-looking strategy that contribute to the discussion of

policies for the future in a comprehensive approach to "health in all policies" in the EU. Scenarios that draw a more positive picture can serve as transformative examples to lead a path into a desirable future. A short description of the scenarios is given in Table 1.

Supported by a mapping of determinants of NCDs in Europe, the developed model will capture the complex set of interrelationships between individuals' history of engagement in risk-taking behaviours, exposure to environmental risks and the resulting distribution of health, social and economic consequences across gender and across social groups. All of these efforts will fuse to elaborate and produce inputs for the empirically-based dynamic micro-simulation tool capable of quantifying the current and future health and economic

impacts of risk factors as well as potential new policies and policy combinations.

Figure 2 below is a graphic overview on trends and their positive (right side) or negative (left side) development and the respective relative development in each scenario compared to current levels are depicted. Factors taken into account were levels of (in)equality, economic development and technological changes, innovation in medicine, empowerment of citizens by means of access to information regarding prevention, the extend of climate change, socio-demographic change measured by expected healthy life years, air pollution due to urban development and food trade, and agricultural practices as very critical or important drivers for the incidence of NCDs. In each of the scenarios positive or negative development of each driver was assumed so that consistent pictures were drawn up. In Fig. 2 the nodes depict these developments either to a negative value (left side) or positive value (right side).

Central fields of action for extended health policies

Out of the four FRESHR scenarios, two contain future aspects of transformative character. Especially the most positive one, “Healthy Together”, carries the most potential in this respect, the second one, “We Will Health You” contains several interesting aspects as well. We will discuss the major areas affected by the transformative quality of the scenarios in the following section.

Inequality

From the positive depictions of a healthy future it becomes quite obvious that this can only be realised in a society where wealth is distributed at an equal basis and equality is achieved in most spheres of life. Policy makers need to take the appropriate measures to establish more equality in society in order to achieve health equity. This will automatically affect the equal access to a better health care as well. For all levels of society we need to find new ways fostering new democratic wealth institutions, and thus universal access to health care. One option for discussion we need to open up is that on universal basic income and if this option carries the potential for more time for a good life and for the care of others. A more democratic approach to wealth creation also needs to include universal access to other public services and goods, incl. education. Here disadvantages by birth or social status etc. need to be balanced because decent, fair and equal education is the best way to health literacy and to give all people the opportunity to understand how they can take responsibility for their own health. One example from FRESHER research is that the training of multiple language skills at young age (before 20) will decrease the likelihood of dementia at higher age [17].

Sustainable growth

One expectation brought forward in the scenarios, especially in the first one, is that digitalisation will make the transition towards a circular economy possible, and thus also provide for better jobs and more free time. This should also include more cooperation amongst citizens for the provision of services that cannot be sold on the market. The assumption is that growth, however defined, will be sustainable and not extract any more resources for our lifestyles than we already have extracted in the past. Here, research, technology and innovation policy is asked to provide incentives for more alternative approaches, such as upcycling, recycling, or frugal innovation.

Medical research, technology and innovation

This kind of approach is also continued in the medical research and innovation field. The transformative scenarios carry the expectations that governments, companies and civil society make decisions together along the value chain of medical research as to what and where investments will be taken. A stronger focus on prevention from all sides (incl. Patients, insurance companies, etc.) would reduce the risk of NCDs considerably, especially if it was accompanied by more promotion for health literacy. High expectations are attached to the participatory approach to health research, to more person-centred and community-based care. All these approaches would be supported by more professions in the health sector and by more transdisciplinarity in health research, so expertise, activities and costs (not only in the monetary sense) are distributed to more people in the community.

The second scenario introduces the idea of monitoring individual health data in order to provide best care possible, accompanied by personalised treatment. There needs to be a broad discussion with civil society and all stakeholders how personalized healthcare beginning from birth should look like. This should include prevention at every stage in life and also virtual healthcare as online health visits might lower the pressure on hospitals and healthcare centres. One open question is: Would it be the role of the governments to strictly control big data?

A prerequisite for such an ambitious approach might be that the medical R&D budget in each country must rise above 3% of GDP. For the governance of future health research a coordination by public bodies at a European level is needed, fostering collaboration and synergies across countries as well as partnerships with private companies. To make health care largely affordable, the drug pricing framework needs a reform to achieve a fair balance between intellectual property and public health rights. Capped prices and attentive regulation on patents should allow for the production of generic drugs few years after the discovery. Public-private partnerships to finance investment in medical research would lessen the

monopoly and power of big pharmaceutical companies on medical innovation.

Knowledge and participation

Transformative aspects of more democratic knowledge creation have already been mentioned in the paragraphs above, especially in connection with improved health literacy. This shows the importance of this type of knowledge. There is also a close relation to health research given that patients provide access to their personal health information. This however can only happen at a voluntary basis. The interlinkages also touch the interdependence of knowledge and participation. Only if citizens, and this includes patients of course, have a chance to life-long learning they will be able to enhance their citizen's skills, for example engage in a better social dialogue between firms and employees, leading to better work conditions overall, keep workforce as healthy as possible, etc. This presumes that lifelong learning is supported by the employer and the government takes the legal changes.

Healthy aging

High degrees of participation and democratisation are also prerequisites for an aging society that wants to stay healthy and agile. Healthy aging is enhanced in communities that care for the individual, where not only health care workers fulfil the task of caring for the people in need of assistance. Age-friendly neighbourhoods, good community relationships among the inhabitants, easy access to all provision sources, sufficient space for social life are items for policy action, not only at community level, but at national as well as at individual level. More participation could also mean that people are longer active in their work life but not necessarily full time. This would also reduce the dependence on social benefits and improve the self-confidence of the elderly. What is more, healthcare pay gaps need to be closed, unemployment rate of elderly who still want to or need to work should not be higher than average in the rest of the work force.

In the second scenario where governments and private companies are keen to keep their workforce healthy and happy for as long as possible legal changes are necessary. More care and responsibility at the workplace would mean that companies adapt work conditions according to the requirements of elderly people. It could also mean that work places have their own healthy canteens and offer medical services, as well as sports and leisure facilities.

Urban life

As depicted in all scenarios, we assume that most people will live in cities or will be strongly connected to cities; they get special attention when it comes to living a sustainable and

healthy life. In order to do so, cities need to become carbon neutral, with an intelligent land use mixture, green areas, renewable energy sources, and the promotion of public transport. As part of the latter, the government has to take respective measures, e.g. impose taxes on individual resource intensive transportation. To make cities attractive places to live in, urban planning needs to guarantee access to housing and essential services while mobility plans regulate daily travelling, especially for commuters. New social houses for less affluent citizens are needed.

Food

What we eat will to a large extent determine our health, especially with regard to NCDs. This will not be much different in the future than it is today. What will be different, however, is that we will have to feed more people and we have to provide healthy food. With the exhausted current agricultural production status, a lot of things will need to change. Agriculture needs a reorientation for local, sustainable, high quality food. Thus, Common Agricultural Policy (CAP) needs to be aligned with the WHO/FAO dietary targets. What is more, to reach consumers, easy access to healthy diets is a requirement. On the production side, small-scale farming, food production for the people, not for meat production, reforestation, transparent production and supply chain of all foods are key issues for an extended health policy. Food needs to be ascribed a social value. This can be improved by closer contact between consumption and production, e.g. in food cooperatives, urban farming projects, or solidarity agriculture. Alternatives to meat production also have to be in the focus of an extended health policy. Will meat largely be produced in laboratories without breeding and slaughtering animals? And again, on the consumption side, canteens in both private companies and public offices might want to serve balanced meals to employees, respecting the WHO/FAO dietary targets. On the side of policy makers, regulation has to be attentive to discourage consumption of unhealthy products, e.g. imposing high taxes on food and drinks that are rich in sugar, salt and fats.

Whither extended health policies for tackling NCDs?

The starting point for this article was the observation that health as a field of action is connected to many other aspects of life and that, therefore, health policy needs to be extended. The second observation was that policy action usually is a reaction to cope with the fast evolving challenges in the policy field whereas expectations are high that policymakers set wise steps in a forward looking manner to design smart policies for the future. We have argued that looking at the usual risk

factors is not enough to tackle the future burden of NCDs. We had to broaden our scope and consider various trends and drivers in nutrition, health care systems, equity, urban developments, or demographic change. We have also argued that health policy alone is not enough to gain a differentiated picture of the future of health, public health, and on NCDs in particular. The inertia of existing structures and institutions in the health and related sectors can get in the way of new possibilities unfolding by considering wider trends and drivers. The structural and institutional room for manoeuvre is often expanded once their shortcomings can no longer be ignored in view of the emerging deficits and conflicts.

One of the key findings was that the range of plausible futures of wider NCD- and public health policies is extremely broad. There are quite a number of different scenario aspects already inherent to an extent in the current analysis of trends and drivers, often evolving tensions that call for action.

This variety of trends, drivers and aspects gives room for normative considerations as shown in this article. It became clear that the normative considerations arise from different levels: individual, neighbourhood, municipal, national,⁵ transnational and from stakeholder perspective as well as from a collective perspective. However, these normative considerations do not give rise to simple guidelines for policy-makers. The traditional tools of policy-making can no longer be used to govern the increasingly diverse aspects attached to NCDs. Since the policy fields need to be extended, as we argue, decisions are to a large extent determined by factors and developments lying outside the traditional policy field and the traditional sphere of national policy making.

Notwithstanding, some lessons can be learnt for future extended health policies: First of all, greater attention should be paid to the societal aspects attached to health and especially to NCDs, going beyond the usual risk factors. Secondly, and of no less importance, the field of actors should be broadened when considering policies containing NCDs. Going beyond patients and health care workers, many more categories of stakeholders are indirectly related to trends and drivers of NCDs and need to be included in the design of new policies. That does not mean that everybody as to be included everywhere but it is the task of policy makers to ignite a social dialogue that enables the engagement of certain stakeholder groups and participate equally in the design of socially robust solutions.

Last but not least, we need to be aware of different and fast changing lifestyles. This can be a challenge but also a window of opportunity to overcome structural inertia. New lifestyles bear the potential of transformative power. With policy actions at the right spots, diverse new lifestyles can contribute to more democratisation, more considerate consumption and production with regards to health effects on oneself and other

creatures. It is a difficult field for policy making because it contains a delicate balance between adaptability and continuity. It requires elasticity for exploration, for trial and error, and for giving room to unconventional alternative measures. Again, these alternatives need to be designed and tested by the crowd and not by policy-makers alone. Funding priorities for research, technology and innovation is just one field of experimentation. But to handle the NCD challenge of the future many more societal fields have to be explored. We have to be aware that these options are often temporary, and contain different temporalities. What works today or in the near future might not work long-term or in 30 years from now. The feature of temporality is especially contained in transformative constellations. Once a transformation has been achieved, the constellation might be obsolete. We have given many examples in this article that resulted from the FRESHER foresight process and that deserve a chance for exploration in the future. All in all, extended health policies can approach the Sustainable Development Goal on NCDs by 2030,⁶ thereby set an example for some of the other SDGs.

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⁵ and even “planetary” (see [18])

⁶ UN SDGs: <http://www.un.org/sustainabledevelopment/health/>

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